

WHAT IS CLAIMED IS:

Sub A17

1. A substrate processing system, comprising:  
a cassette load station;  
5 a load lock chamber, wherein said load lock chamber  
comprises double dual slot load lock constructed at same  
location;  
a transfer chamber, wherein said transfer chamber is  
centrally located; and  
10 one or more process chambers, wherein said process  
chambers are located about the periphery of said transfer  
chamber.

- 15 2. The substrate processing system of claim 1,  
wherein said substrate is a wafer or a glass substrate.

3. The substrate processing system of claim 1,  
20 wherein said dual slot load lock has a heating plate and a cooling  
plate, wherein said heating plate and cooling plate are located in  
different slots.

- Sub A27  
4. The substrate processing system of claim 3,  
wherein said heating plate is a stationary plate or a moving plate.

5. The substrate processing system of claim 4,  
wherein the moving heating plate is operated by Z-drive.

Sub A37 6. The substrate processing system of claim 3,  
wherein said heating plate heats up to a temperature of about  
400°C.

10 7. The substrate processing system of claim 3,  
wherein said cooling plate is a stationary plate or moving plate.

15 8. The substrate processing system of claim 7,  
wherein the moving cooling plate is operated by Z-drive.

Sub A47 20 9. The substrate processing system of claim 3,  
wherein said cooling plate cools the temperature down from  
about 350°C to about 80°C.

25 10. The substrate processing system of claim 9,  
wherein said cooling is done by water or by nitrogen gas.

11. The substrate processing system of claim 10,  
wherein said nitrogen gas is mixed with helium.

12. The substrate processing system of claim 1,  
further comprising:

5 a vacuum robot, wherein said vacuum robot is located  
in said transfer chamber and load/unload the substrate between  
said load lock chamber and said transfer chamber.

13. The substrate processing system of claim 12,  
10 wherein said vacuum robot is operated by Z-drive.

14. The substrate processing system of claim 1,  
further comprising:

15 a flip type door, wherein said door is located between  
the cassette load station and the load lock chamber.

15. The substrate processing system of claim 1,  
20 further comprising:

flip type slit valves, wherein said valves are located  
between the load lock chamber and the transfer chamber.

25 16. The substrate processing system of claim 15,  
wherein said valves are closed from atmospheric side and  
operated below substrate transferring plane.

17. The substrate processing system of claim 1,  
further comprising:

filter diffusers, wherein said filter diffusers are  
located in the double dual slot load locks to prevent particle  
5 generation in said load locks.

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18. A method of processing substrates in the system  
of claim 1 for semiconductor manufacturing, comprising the  
10 steps of:

moving pre-processed substrates from the cassette  
load station to the transfer chamber through the load lock  
chamber;

transferring said substrates from said transfer  
15 chamber to the process chambers;

processing said substrates in said process chambers;  
and

unloading the processed substrates from said process  
chambers to said cassette load station through said load lock  
20 chamber; wherein first dual slot load lock in said load lock  
chamber is in a vacuum condition for unloading pre-processed  
substrates from said load lock chamber to said transfer chamber,  
whereas at the same time second dual slot load lock in said load  
lock chamber is in an atmospheric condition for unloading  
25 processed substrates from said load lock chamber to said  
cassette load station.

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19. The method of claim 18, wherein said substrate is a wafer or glass substrate.

5 20. The method of claim 18, wherein the moving step further comprising the step of:

heating said pre-processed substrates in said first dual slot load lock to a temperature of up to about 400°C.

10 21. The method of claim 18, wherein the transferring step is performed by a vacuum robot driven by Z-drive.

15 22. The method of claim 18, wherein the unloading step further comprising the step of:

cooling said processed substrates in said second dual slot load lock from about 350°C to about 80°C.

20 23. The method of claim 22, wherein said cooling is done through venting using small amount of helium gas mixed with nitrogen gas.

25 24. The method of claim 22, wherein said cooling is done by water.